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northern South America, South Africa, Algeria, Egypt and the Soudan, India and Ceylon, China, Japan, New Zealand and Australia. He very evidently collected vigorously, both by eye and by net, not confining himself to butterflies, notwithstanding the title. In fact the majority of the illustrations in this part of the book as well as many of the notes concern other insects. These notes are largely simple records of captures, leavened somewhat by random remarks concerning them or his traveling experiences. In view of the large amount of ground covered in so short a time, the lists of species for given localities are naturally too incomplete to be important and they must certainly detract from the interest of the narrative for non-entomologists.

The last chapter is based upon two papers by the same author in the *Trans. Ent. Soc. London* and is a summary of bionomic notes made chiefly by Dixey and the author on butterflies. The odor of many species is described; mutilated specimens are listed as having escaped from foes; peculiarities of flight and resting attitudes, including the selection of harmonizing backgrounds, are discussed, and the conclusions are orthodox neo-Darwinian.

The appendix consists of a translation of twelve of Fritz Müller's papers on the scent-organs of Lepidoptera. Six of these were published in Portuguese in the *Arch. do Mus. Nat. do Rio de Janeiro* where they have been inaccessible to many. The translations are by E. A. Elliott and the introduction to the appendix is by Poulton. The collection and translation of these papers will be a great help to students and it is well that they be read in connection with Longstaff's observations. However only the last chapter (and not all of that) is necessary for this purpose, and it does seem unfortunate that the rest of the book was not bound separately.

F. E. LUTZ

THE TALKING DOG

EXTENSIVE comment has been made in the German and even in the American daily press

on the reported conversational ability of "Don," a German setter seven years old, belonging to the royal gamewarden Ebers at Theerhutte in Gardelegen. Numerous observers reported that he had a vocabulary consisting of eight words, which he could speak if food were held before him and the following questions propounded: "Was heisst du?" "Don." "Was hast du?" "Hunger." "Was willst du?" "Haben haben." "Was ist das?" "Kuchen." "Was bittest du dir aus?" "Ruhe." Moreover, he was said to answer categorical questions by "Ja" and "Nein"; and in reply to another question, to speak the name, "Haberland." Among others whom popular report mentioned as witnesses to this extraordinary ability of the dog was Mr. Oskar Pfungst, of the Psychological Institute of the University of Berlin, whose important tests on the horse of Herr von Osten, "Der Kluge Hans," have lately been published in English.¹ Mr. Pfungst had in fact investigated the behavior of the dog in collaboration with Professor Vosseler and Dr. Erich Fischer, keeping detailed memoranda on the tests, and making a number of phonographic records. Partly to clear up misapprehension of his own position and partly for the enlightenment of the serious general public, he gave out a brief popular report of his work,² a summary of which appears below.

Having proposed three definitions of speech: first, properly, as the use of vocal sounds to convey to the listener an idea experienced by the speaker; secondly, more loosely, as the production of vocal sounds learned by imitation, but used without knowledge of their meaning to the hearer; and thirdly, as the production of vocal sounds not imitative of human speech, having no meaning to the speaker, but producing in the hearer illusions of definitely articulated, spoken words, uttered to convey meaning—Mr. Pfungst then asks to

¹ Pfungst, Oskar, "Clever Hans." Translated by Carl L. Rahn. New York, Henry Holt & Company, 1911.

² "Der sprechende Hund," von Oskar Pfungst (Berlin), Sechste Beilage zur Possischen Zeitung, 27 April, 1911.

which class the speech of Don properly may be referred.

First, it is plain enough that the dog does not use words with any consciousness of their meaning to the hearer. His vocabulary is always given in order, beginning with "*Don*" and ending with "*Ruhe*." If the order of questioning is varied he is called "*Kuchen*" and he desires "*Hunger*," etc. (Here it may be noted that the author was unable to get even approximations to the last three words in the list accredited to the animal.)

Secondly, it is evident, says Mr. Pfungst, that he is not using words learned by imitation. The author assumes that any imitator of another speaker would vary the pitch, intensity or accent of his words as the imitator's were varied. Don's voice—a high tenor, ranging from F on the bass clef to the octave above middle c, usually pitched in talking near d above middle c—is not varied when the pitch of the questioner's voice is altered. Furthermore he does not imitate changes in accent or intensity. He is as likely to say "*Kuchén*" as "*Kúchen*"; "*Hungér*" as "*Húnger*," etc. From the legitimacy of the author's adoption of this criterion, however, the reviewer is inclined to dissent. His own experience with a child of two and one half years, learning readily to speak a large number of words and phrases from imitation, and able to give both vowel and consonant values with perfect distinctness, for several months was that she would not imitate changes of intensity or pitch, although she usually showed apparent willingness to try. To apply this principle in the case of the dog would require the assumption of an attentive ability as well as of motor skill, far in excess of any of which that animal has given evidence. But Mr. Pfungst offers other disproof of the imitation hypothesis which to the reviewer seems adequate. This is found in the method of learning. The first word which the dog is reported to have uttered is "*Haben*." We are assured that being asked, "Willst du etwas haben," he thereupon pronounced distinctly the words, "*Haben haben haben*," and was rewarded with food for his pains. When he afterwards at-

tempted to pronounce the words he would give many inarticulate gurgles, but the food was given only when the correct number of syllables were uttered at once. The owner's family state that ten repetitions, some a week apart, sufficed for this learning. The word, "*Ruhe*," was first uttered after a command, "Ruhe," by the owner's daughter. Hearing the dog's response, she demanded, "Was sagst du da," and obtained again the answer "*Ruhe*." He was then taught to give this word after his fifth question, "Was bittest du dir aus?" The name, "*Haberland*," which none of the investigators could obtain from him, was first answered without instruction to the question, "Wer hat den ersten Artikel über dich in die Zeitung gebracht?" These facts are hardly consistent with any provable experience in learning by imitation. Indeed, it may be remarked that to the reviewer, who has spent the greater part of two years in experimentation on the behavior of dogs under controlled conditions, the animals' vagueness of perception and extremely low degree of attention would make a very strong presumption against the possibility of their learning even the simplest acts by "observation and imitation."

Mr. Pfungst concludes that the speech of Don is therefore to be regarded properly as the production of vocal sounds which produce illusions in the hearer. He calls attention to the fact that not even the number of syllables in any given "word" of Don's is constant. The dog makes only one vowel sound, having a value lying between *o* and *u*, varying considerably, but usually nearer *u*. The experimenters could not hear from him certainly either *a* or *e*. His one guttural-aspirant is like the German *ch*, and does duty for *k* and *h*. There is also a nasal, of a value lying between *n* and *ng*. When it is not prolonged it passes for a *d*, as in "*Don*." He really never makes the sound of *b*, *d*, *k*, *l* or *r*. When he utters a word expressed by [(*ch*)*unguo*], not much effort is required from a suggestible hearer to perceive the sound as "*Hunger*." When in making phonograph records the questioner asked merely "Was?," the dog gave

the customary answers, "Don," "Hunger?" "Haben haben," "Kuchen," etc., of which however only two out of sixteen answers were intelligible. Of 168 answers preserved on phonograph records, 71 per cent. were disyllabic and of the monosyllabic noises 68 per cent. were given when a considerable pause had elapsed between the last answer and this question. The "answers" were really incorrect fully as often as otherwise. Disinterested hearers could seldom distinguish his "Hunger" from his "Haben," nor his "Ruhe" from his "Kuchen," etc. It was as easy for others to perceive some of these same sounds as "Engelhof" or "Hallelujah"; "Huhn" or "Honig." Here it seems to the author we have a case quite parallel with our common interpretation of the night-swallow's call as "Whip-poor-Will" when in fact the sounds are nearly "Pfif-ah-rih"; and with the common German interpretation of their *Steinkanz's* "Ku-witt" or "Ku-wiff" as "Komm mit," thus making him in popular superstition the messenger of death. But for a strong and uninhibited tendency thus to "apperceive" them, neither these calls nor the "words" of Don would be taken as other than meaningless noises.

On psychological grounds, Mr. Pfungst concludes, the explanation is comparatively simple; the uncritical do not make the effort to discriminate between what is actually given in perception and what is merely associated imagery, which otherwise gives to the perception a meaning wholly unwarranted; and they habitually ignore the important part which suggestion always plays in ordinary situations.

Accepting this explanation as satisfactory we may expect the majority of animal lovers to continue to read their own mental processes into the behavior of their pets. Nor need we be astonished if even scientists of a certain class continue at intervals to proclaim that they have completely demonstrated the presence in lower animals of "intelligent imitation" and of other extremely complicated mental processes—inferred from the results of brief and lamentably superficial

tests, and published as proven facts without further reflection.

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FOURTH LIST OF GENERIC NAMES FOR
THE "OFFICIAL LIST OF ZOOLOGICAL
NAMES," PROVIDED FOR BY THE
GRAZ CONGRESS

15.¹ The following generic names of Diptera are proposed for *inclusion* in the "Official List of Generic Names." The species mentioned are the correct types, according to Coquillett, 1910.

- Anopheles* Meig., 1818, 10, type *bifurcatus*.
Anthomyia Meig., 1803, 281, type *Musca pluvialis*.
Chrysops Meig., 1800, 23, type *cæcutiens*.
Corethra Meig., 1803, 260, type *Tipula culiciformis*.
Culex Linn., 1758a, 602, type *pipiens*.
Cuterebra Clark, 1815, 70 type *Æstrus cuniculi*.
Gasterophilus Leach, 1817, 2, type *Æstrus intestinalis* (cf. *Æ. equi*).
Hæmatobia St. Farg. & Serv., 1828, 499, type *Conops irritans*.
Hippelates Loew, 1863, 36, type *plebejus*.
Hippobosca Linn., 1758a, 607, type *equina*.
Hypoderma Latr., 1818, 272, type *Æstrus bovis*.
Lucilia Desv., 1830, 452, type *Musca cæsar*.
Musca Linn., 1758a, 589, type *domestica*.
Muscina Desv., 1830, 406, type *stabulans*.
Nycteribia Latr., 1796, 176, type *Pediculus vesper-tilionis*.
Æstrus Linn., 1758a, 584, type *ovis*.
Ophyra Desv., 1830, 516, type *Anthomyia leucostoma*.
Phora Latr., 1796, 169, type *Musca aterrima*.
Piophilæ Fall., 1810, 20, type *Musca casei*.
Psorophora Desv., 1827, 412, type *Culex ciliatus*.
Sarcophaga Meig., 1826, 14, type *Musca carnaria*.
Stegomyia Theob., 1901, 234, type *Culex calopus*.
Stomoxys Geoffr., 1762, 538, type *Conops calcitrans*.
Tabanus Linn., 1758a, 601, type *bovinus*.
Tipula Linn., 1758a, 585, type *oleracea*.

16. The following generic names of Diptera are proposed for *exclusion* from the "Official List," on the ground that they are absolute homonyms and preoccupied.

- Acanthina* Wiedem., 1830, not Fisch., 1806.
Allocotus Loew, 1872, not Mayr, 1864.
Ammobates Stann., 1831, not Latr., 1809.

¹ Paragraphs are numbered continuously with the earlier lists.